Claims

1. A WDM add/drop multiplexer structure comprising a plurality of WDM laser assemblies, wherein the WDM add/drop structure is arranged, in use, in a manner such that a controlled temperature environment is created around laser sources of the laser assemblies, and in a manner such as to be capable of creating the controlled temperature environment around the laser sources while the WDM add/drop multiplexer structure is subjected to an outside temperature ambient experienced in an Outside plant (OSP) situation.

2. A WDM add/drop multiplexer structure as claimed in claim 1, wherein the controlled temperature environment is defined by a low reference temperature value and a high reference temperature value.

3. A WDM add/drop multiplexer structure as claimed in claim 1, wherein the WDM add/drop multiplexer structure comprises at least one further temperature sensitive device, and the WDM add/drop structure is arranged in a manner such that the controlled temperature environment is also created around the further temperature sensitive devices.

4. A WDM add/drop multiplexer structure as claimed in claim 1, wherein the WDM add/drop structure comprises one or more housings in which the laser assemblies are located, and an active temperature controlling device arranged, in use, to heat an inside of the housings based on a measured temperature and a low temperature reference value.

5. A WDM add/drop multiplexer structure as claimed in claim 4, wherein the measured temperature is the actual temperature inside the housings.

6. A WDM add/drop multiplexer structure as claimed in claim 4, wherein the measured temperature is an ambient temperature around the housing.

7. A WDM add/drop multiplexer structure as claimed in claim 6, wherein the ambient temperature is measured outside the WDM add/drop multiplexer structure.

8. A WDM add/drop multiplexer structure as claimed in claim 4, wherein the temperature controlling device is further arranged, in use, to cool the housings based on the measured temperature and a high reference temperature value.

9. A WDM add/drop multiplexer structure as claimed in claim 8, wherein the housings comprise thermally insolated walls to reduce passive thermal load.

10. A WDM add/drop multiplexer structure as claimed in claim 4, wherein heat generating components of the laser assemblies are located outside of the housing, the WDM add/drop multiplexer structure being arranged, in use, in a manner which provides suitable connections between the heat generating components located outside the housing and laser sources of the laser assemblies located inside the housing.

11. A WDM add/drop multiplexer structure as claimed in claim 1, wherein each laser assembly comprises:

- a semiconductor laser source.

- a heating unit for heating a junction of the semiconductor laser source,

- a cooling unit for cooling the junction, and

- a control unit for controlling operation of the heating and cooling units,

wherein the control unit is arranged, in use, to determine the actual temperature at the junction and to compare the actual temperature with a high reference temperature value and a low reference temperature value, and to selectively activate the heating and cooling units based on that comparison.

12. A WDM add/drop multiplexer structure as claimed in claim 11, wherein the control unit is arranged to activate the heating unit when the actual temperature falls below the low reference temperature value, and to activate the cooling unit when the actual temperature increases above the high reference temperature value.

13. A WDM add/drop multiplexer structure as claimed in claim 11, wherein the laser assembly further comprises a driver unit arranged, in use, to regulate a bias current of the semiconductor laser source to compensate for variations in a power output of the semiconductor laser source as a result of a tolerated temperature range of the controlled temperature environment.

14. A WDM add/drop multiplexer structure as claimed in claim 13, wherein the driver unit is arranged, in use, to regulate the bias current based on the actual temperature at the junction determined by the control unit.

15. A WDM add/drop multiplexer structure as claimed in claim 13, wherein the driver unit is arranged, in use, to regulate the bias current based on the actual power output of the semiconductor laser source.

16. A WDM add/drop multiplexer structure as claimed in claim 13, wherein the driver unit is further arranged, in use, to provide a modulation current to the semiconductor laser source.

17. A WDM add/drop multiplexer structure as claimed in claims 11, wherein the heating unit and cooling unit of each laser assembly are implemented as a duel function heating/cooling unit.

18. A WDM add/drop multiplexer structure as claimed in claim 11, wherein the duel function heating/cooling function comprises a TE device.

19. A WDM add/drop multiplexer structure as claimed in claim 2, wherein the WDM add/drop multiplexer structure comprises a plurality of WDM filters, and the high and low reference temperature values are chosen in a manner which ensures that, in use, wavelength drifts in the lasers are limited to a drift value equal to or less than a pass band of the WDM filters, whereby the wavelength drifts, in use, do not exceed a channel spacing of the WDM add/drop multiplexer structure.

20. A WDM add/drop multiplexer structure as claimed in claim 2, wherein the high reference temperature is at least 70°C.

21. A WDM add/drop multiplexer structure as claimed in claim 2, wherein the low reference temperature is 0°C or less.

22. A WDM add/drop multiplexer structure comprising a plurality of laser sources for providing optical WDM channel signals, wherein a wavelength spacing between the WDM channels is chosen in a manner which ensures that, in use, tolerated wavelength drifts of the laser sources as a result of tolerated temperature variations are equal to or less than the wavelength spacing.

23. A WDM add/drop multiplexer structure as claimed in claim 22, the laser sources comprise un-cooled lasers.

24. A WDM add/drop multiplexer structure as claimed in claim 22, wherein the WDM add/drop multiplexer structure designed as a CWDM add/drop multiplexer structure.

25. A laser assembly comprising:

- a semiconductor laser source,

- a heating unit for heating a junction of the laser source,

- a cooling unit for cooling the junction. and

- a control unit for controlling operation of the heating and cooling units,

wherein the control unit is arranged, in use, to determine the actual temperature at the junction and to compare the actual temperature with a high reference temperature value and a low reference temperature value, and to activate the heating and cooling units based on that comparison, a controlled temperature environment around the laser source created, and wherein the laser assembly is arranged, in use, in a manner such as to be capable of creating the controlled temperature environment while being subjected to an outside temperature ambient experienced in an OSP situation.

26. An WDM network incorporating a WDM add/drop multiplexer structure as claimed in claims 1, 4 or 11.